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INVESTOR IN PEOPLE

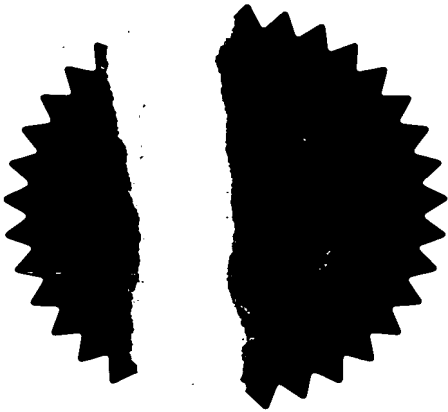
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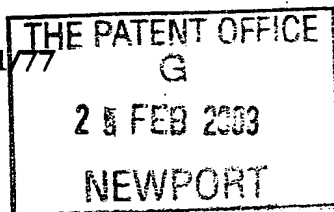
Dated 12 August 2003





Patents Form 1/77

Patents Act 1977  
(Rule 16)



25FEB03 E787484-1 000107  
P01/7700 0.00-0304186.0

1/77

## Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road  
Newport  
South Wales  
NP10 8QQ

1. Your reference

TC/JW-MP100381-GB

2. Patent application number

(The Patent Office will fill in this part)

25 FEB 2003

0304186.0

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Aspect Management Limited  
Wrenbury Hall  
Wrenbury  
Nantwich  
Cheshire CW5 8EJ

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

UK

8428724001

4. Title of the invention

Coupling Arrangement

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Lloyd Wise, McNeight & Lawrence  
Regent House, Heaton Lane  
Stockport, Cheshire SK4 1BS

Patents ADP number (if you know it)

08458275001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

UK

0226895.1

19 November 2002

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

# Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description	8
Claim(s)	3
Abstract	1
Drawing(s)	5 + 5 <i>the</i>

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) 1

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(*please specify*)

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

*Lloyd Wise, Mcneight & Lawrence*

24 February 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Dr Jonny Wood 0161 480 6394

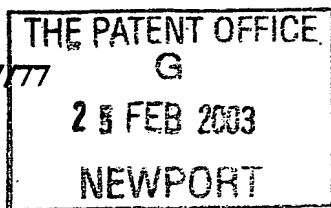
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Patent Form 7/77  
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## Statement of inventorship and of right to grant of a patent

The Patent Office

Cardiff Road  
Newport  
South Wales  
NP10 8QQ

1. Your reference

TC/JW-MP100381-GB  
25 FEB 2003

2. Patent application number  
(if you know it)

0304186.0

3. Full name of the or of each applicant

Aspect Management Limited

4. Title of the invention

Coupling Arrangement

5. State how the applicant(s) derived the right from the inventor(s) to be granted a patent

By virtue of employment

6. How many, if any, additional Patents Forms 7/77 are attached to this form?  
(see note (c))

None

7. I/We believe that the person(s) named over the page (and on any extra copies of this form) is/are the inventor(s) of the invention which the above patent application relates to.

Signature

Date

Lloyd Wise, McNeight & Lawrence

24 February 2003

8. Name and daytime telephone number of person to contact in the United Kingdom

Dr Jonny Wood 0161 480 6394

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Enter the full names, addresses and postcodes of the inventors in the boxes and underline the surnames

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UK

820007001

Patents ADP number (if you know it):

Patents ADP number (if you know it):

Patents ADP number (if you know it):

Reminder

Have you signed the form?

## COUPLING ARRANGEMENT

This invention relates to conservatory roof constructions and is particularly  
5 concerned with the interconnection of frame components in angular relationship with one  
another.

Interconnection arrangements for this purpose are already known - see for  
example GB Patent No. 2323107 (Ultraframe (UK) Limited) and European Patent  
10 Application No. 945561 (Rickmans Limited), the disclosures of which provide background  
information relating to the types of conservatory roof constructions that the present  
invention is concerned with.

The present invention seeks to provide an improved arrangement for  
15 interconnection of a jack rafter to a main beam of a roof.

According to the present invention there is provided a framework comprising  
first and second elongate frame members which are coupled together in angular relation  
relative to one another by a coupling arrangement, the coupling arrangement comprising  
20 a plate with an upstanding pivot post, channel means associated with and extending  
longitudinally of the first frame member for receiving the plate and maintaining it captive  
against separation from the first member in a direction generally transverse to its  
elongation, and an arm adapted to be coupled to the pivot post and to the second frame  
member.

25 The channel means may have an opening from which the pivot post projects  
in a direction generally transverse to the elongation of the first member.

At least one of the sides bounding the opening of the channel means may be provided with a groove for reception of the plate.

5 The plate may be introduced into the channel means from one end of the first member and then adjusted by sliding it along the channel means to the desired location at which the second frame member is to be coupled to the first.

10 Alternatively, the plate may be so dimensioned that, in one orientation, it can be passed through the opening of the channel means and then turned about the axis of the pivot post to a second orientation in which it bridges the channel means and is trapped against withdrawal through the opening (unless returned to said one orientation). This has the advantage that the pivot post can be immediately located at any desired position without having to insert the plate at one end of the first frame member and then slide it lengthwise along the channel means.

15

20 The plate may co-operate with the channel means in such a way that, when turned from said one orientation, resistance to turning in the opposite direction is developed. For instance, the co-operation between the channel means and the plate may involve a wedging or binding action or an interference fit. For example, sides of the plate may be shaped or provided with formations so that, as the sides ride over the channel means during rotation from said one orientation to the trapped orientation, such shaping and/or formations engage with the channel means and a wedging, binding or other mechanism is obtained which resists turning of the plate in the reverse direction.

25 The plate may comprise a restraining means such that when the plate is inserted into the channel and turned to the trapped orientation, movement of the plate in a vertical direction (i.e. along the axis of the pivot post) causes the restraining means to

closely fit with the sides of the opening of the channel means, thereby preventing any further turning of the plate and restraining the plate in the desired position.

5       The restraining means may comprise at least one projection. The plate may be provided with a number of projections positioned in angularly spaced relation around the post so as to co-operate with at least one of the sides of the channel means to effect restraint.

10       The projection may be a raised platform, at least one ridge, at least one stud, or combinations thereof.

15       The platform may have dimensions such that at least one of the sides of the platform closely engages with at least one of the sides of the opening of the channel means, thereby restraining the plate in the desired position. The platform may have non-circular dimensions, for example, it may be elliptical, rectangular or square. The pivot post may be mounted on the raised platform.

20       The at least one ridge may be positioned on the plate so as to closely engage with at least one of the sides of the channel means. The ridge may have non-circular dimensions, for example, it may be oval, rectangular or square.

      The frame members may be extrusions, e.g. of a metal such as aluminium or an alloy thereof or a plastics material.

25       The first frame member may be a hip frame member of a conservatory roof and the second frame member may be a jack rafter extending between the hip frame member and the eaves beam of the roof.

The invention will now be described by way of example only with reference to the accompanying drawings in which:

5 Figure 1 is a schematic exploded view showing a hip bar, a jack rafter and a coupling arrangement in accordance with a first embodiment of the present invention;

10 Figure 2 is a plan view showing the jack rafter assembled to the hip bar in accordance with first and second embodiments of the present invention;

Figure 3 is a sectional view of the hip bar in accordance with a first embodiment of the present invention;

15 Figure 4 is a plan view of the pivot post and plate unit in accordance with a first embodiment of the present invention;

Figure 5 is a side elevation of the pivot post and plate unit in accordance with a first embodiment of the present invention;

20 Figure 6 is a schematic exploded view showing a hip bar, a jack rafter and a coupling arrangement in accordance with a second embodiment of the present invention;

25 Figure 7 is a sectional view of the hip bar in accordance with a second embodiment of the present invention;

Figures 8A and 8B respectively show the pivot post and plate unit in plan view and side elevation in accordance with a second embodiment of the present invention; and

5                Figures 9 A, B and C respectively illustrate successive stages in the assembly of the coupling arrangement with a glazing bar, according to a second embodiment of the present invention.

10              Referring to the drawings, the components 10 and 12 respectively constitute a hip bar and jack rafter forming part of a hipped conservatory roof. The hip bar 10 extends from the ridge (not shown) of the roof to the eaves beam while the jack rafter 12 extends between the hip bar 10 and the eaves beam (not shown). In practice, there may be a jack rafter extending from each side of a hip bar to the eaves beam.

15              Each component 10, 12 is formed as an extrusion and is of inverted T-shape comprising a central stem 14 with laterally projecting arms 16 on each side for use in supporting glazing or roofing sheets between the components. The upper ends of the stems 14 are adapted for use with cappings (not shown) which trap and effect sealing engagement with the sheets. In the case of the hip bar, the arms 16 include a base 18 and  
20              an upwardly directed wall 20 thereby forming a channel 22 on each side of the stem 14, the channel extending lengthwise of the extrusion and having an upwardly directed opening 24.

25              As shown in Figure 2, the jack rafter 12 is connected to the hip bar 10 at an angle, the connection being made by means of a coupling arrangement comprising a pivot post 26 upstanding from a plate 28 and a pivot arm 30 which can swivel about the post 26 and is connected to the central stem 20 of the jack rafter 12 in face to face relation with the stem 20, e.g. by a suitable fastener or fasteners such as bolts 31 and associated nuts. In a

second embodiment of the present invention the plate 28 comprises a restraining means 29, described in more detail hereinafter.

In the illustrated embodiments, the arm 30 is provided with circular holes for reception of the bolts or other fasteners. However, in practice, to allow the pitch of the jack rafter to be adjusted according to requirements, the holes in the arm and also holes in the central stem of the 14 the jack rafter may be elongated and possibly curved so that the jack rafter 12 can be tilted upwardly or downwardly to the appropriate pitch while the bolts are in place and then retained at the desired angle of pitch by operating the fastener(s) to firmly secure the arm to the stem 14. To this end, the elongated holes or slots in the arm may be generally transverse relative to those in the stem 20 of the jack rafter.

The pivot post 26 is located on the hip bar 10 by the plate 28 which is trapped in the channel 22. In the illustrated embodiments, the plate is of generally rectangular shape with one pair of sides longer than the other, the short dimension being such that the plate 28 can be introduced into the channel 22 through the opening 24. After registering the plate 28 within the channel 22, it can then be turned through about 90 degrees so that its long dimension more than bridges the opening 24 thereby rendering the plate 28 captive to the channel 22. In the first illustrated embodiment (Figures 1-5), the borders of the channel 22 are extruded with grooves 34 for locating the short sides of the plate 28.

When the plate 28 is received in this way within the channel 22, the pivot post 26 projects generally upwardly in a direction generally transverse to the elongation of the hip bar 10. To facilitate turning of the plate 28, its short sides are contoured in the manner shown in Figure 5 so that it can be turned through 90 degrees until the portions 32 are substantially parallel with and proximate to the stem 14 and the wall 20. In this condition, the portions 22 may be sufficiently close to the stem and wall 20 that turning of the plate beyond 90 degrees is prevented.

The arm 30 is formed with a generally cylindrical sleeve 36 at one end for reception of the post 26. Means is provided for preventing lifting of the arm from the post, e.g. the post may be formed with a screw thread and a nut 38 may be provided for engagement with the thread to retain the arm 30 coupled to the post 26. The nut or other means may be used to fix or clamp the arm 30 in a desired angular relation when the appropriate positioning of the jack rafter has been obtained. The sense of the thread on the post may be such that tightening of the nut takes place in the same direction as turning of the plate 28 when moving it to the trapped position.

In order to reduce the relatively insignificant risk of the plate 28 becoming dislodged from the channel 22 as a result of somehow turning back in the reverse direction, it may be formed in such a way that a binding or wedging action is obtained during turning of the plate to the trapped orientation (Figure 1). This may be achieved in various ways, e.g. by curling up the short edges of the plate so as to produce an interference fit within the grooves 34. Additionally or alternatively, the plate may be provided with formations such as teeth which "bite" into the material of the hip bar and resist or prevent turning of the plate in the reverse direction.

In the illustrated embodiments, the plate 28 is dimensioned so that it can be inserted through the openings 24 and then turned to render it captive to the hip bar. In a modification of the first embodiment, the plate may be insertable into the grooves 34 from one end of the hip bar and then adjusted to the desired position by sliding.

In the second illustrated embodiment (Figures 6-9), the plate 28 comprises restraining means 29, i.e. a generally square raised platform upon which the pivot post 26 is centrally mounted, the platform having dimensions which are substantially equal to the width of the opening 24. The plate is of generally rectangular shape with one pair of sides longer than the other, the short dimension being such that the plate 28 can be introduced

into the channel 22 through the opening 24 (see Figure 9A). After registering the plate 28 within the channel 22, it can then be turned through about 90 degrees so that the long dimension of the plate more than bridges the opening 24 (see Figure 9B), and the sides of the platform 29 can fit closely with the sides of the channel 22. Tightening of a nut 38 onto the post 26 with the pivot arm 30 in place on the post 26 raises the coupling arrangement until the sides of the platform 29 fit closely within the sides of the channel 22. At this point, the plate 28 engages the undersides of the flanges 42, 44 to render the coupling arrangement captive with the channel 22. Additionally, registration of the platform 29 as a close fit within the mouth of the channel restrains the plate 28 against rotation from the captive position.

Although the second embodiment is illustrated with a platform 29 located on the plate 28, it will be understood that the restraining function of the platform 29 may be implemented in other ways. For example, there may be one or more projections provided on the same side of the plate as the post and so arranged that free entry of the coupling arrangement into the channel can be effected in one orientation of the coupling arrangement and the projection(s) block rotation of the plate 28 once the latter has been rotated into the captive position and the arrangement has been raised to register the projection(s) with the channel mouth.

20

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance, it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features disclosed herein and/or shown in the drawings whether or not particular emphasis has been placed on such feature or features.

25

## CLAIMS

1. A framework comprising first and second elongate frame members which are coupled together in angular relation relative to one another by a coupling arrangement,  
5 the coupling arrangement comprising a plate with an upstanding pivot post, channel means associated with and extending longitudinally of the first frame member for receiving the plate and maintaining it captive against separation from the first member in a direction generally transverse to its elongation, and an arm adapted to be coupled to the pivot post and to the second frame member.  
10
2. A framework as claimed in Claim 1 in which the channel means has an opening from which the pivot post projects in a direction generally transverse to the elongation of the first member.
- 15 3. A framework as claimed in Claim 1 or 2 in which at least one of the sides bounding the opening of the channel means is provided with a groove for reception of the plate.
4. A framework as claimed in any one of Claims 1 to 3 in which the plate is so  
20 dimensioned that, in one orientation, it can be passed through the opening of the channel means and then turned about the axis of the pivot post to a second orientation in which it bridges the channel means and is trapped against withdrawal through the opening.
5. A framework as claimed in Claim 4 in which the plate co-operates with the  
25 channel means in such a way that, when turned from said one orientation, resistance to turning in the opposite direction is developed.

6. A framework as claimed in any one of Claims 1 to 3 in which the arrangement is such that the plate can be introduced into the channel means from one end of the first member and then adjusted by sliding it along the channel means to a desired location.

5

7. A framework as claimed in any one of the preceding claims in which the plate comprises a restraining means to engage with the sides of the opening of the channel means to prevent movement of the plate from its captive position.

10

8. A framework as claimed in claim 7, the restraining means comprising a projection or projections located on the same side of the plate as the post.

9. A framework as claimed in claim 8 in which the projection comprises at least one platform, ridge, or stud.

15

10. A framework as claimed in any one of the preceding claims in which the first frame member is a hip frame member of a conservatory roof and the second frame member is a jack rafter extending between the hip frame member and the eaves beam of the roof.

20

11. A framework as claimed in any one of the preceding claims including means for coupling together the arm and the second frame member in such a way as to allow upward and downward tilting of the second member relative to the first member.

25

12. A framework as claimed in Claim 11 in which the coupling means includes elongated slot means in at least one of the arm and the second member and fastening means insertable through the slot means.

13. A framework as claimed in Claim 12 in which said at least one slot means is of curved configuration.

14. A framework as claimed in Claim 11, 12 or 13 in which the arm is coupled  
5 in face to face relation with a vertically disposed flat wall of the jack rafter.

15. A framework substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

## **ABSTRACT**

### **COUPLING ARRANGEMENT**

5 A framework, e.g. part of a conservatory roof, comprises first and second elongate frame members, e.g. a hip bar and jack rafter, which are coupled together in angular relation relative to one another by a coupling arrangement, the coupling arrangement comprising a plate with an upstanding pivot post, channel means associated with and extending longitudinally of the first frame member for receiving the plate and maintaining it captive against separation from the first member in a direction generally transverse to its elongation, and an arm adapted to be coupled to the pivot post and to the  
10 second frame member.

1/5

Figure 1

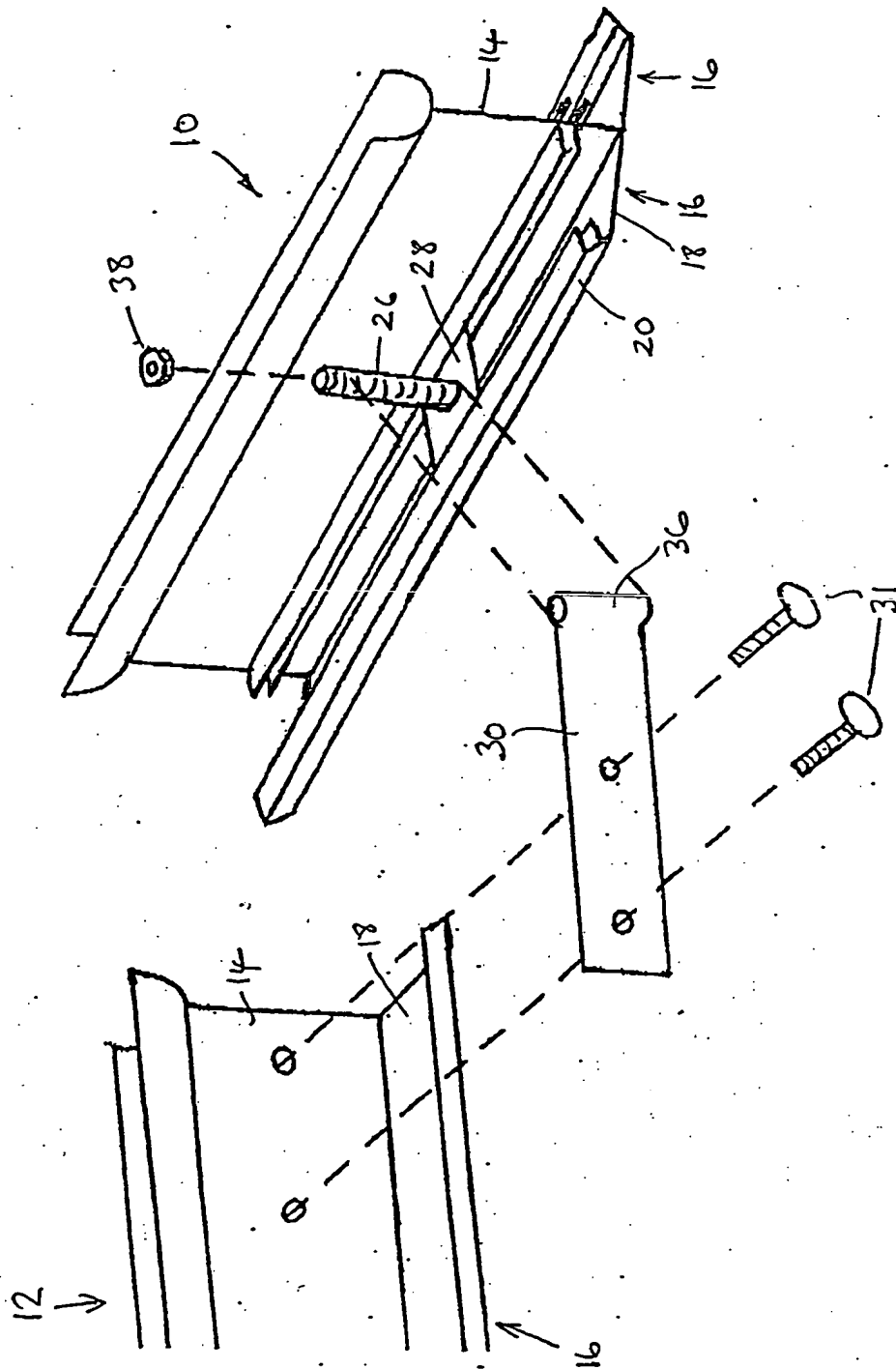




Figure 2

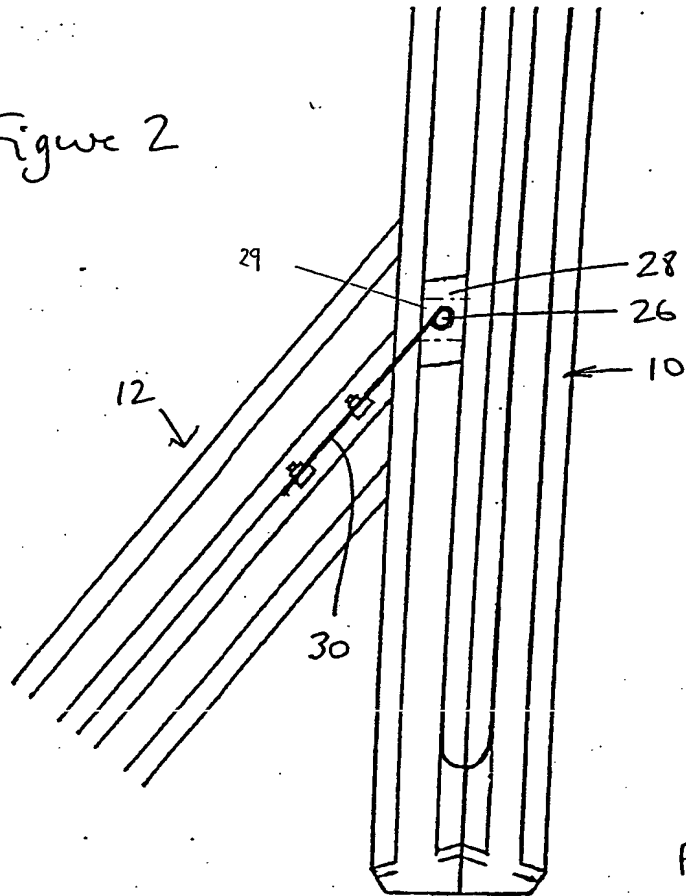


Figure 3

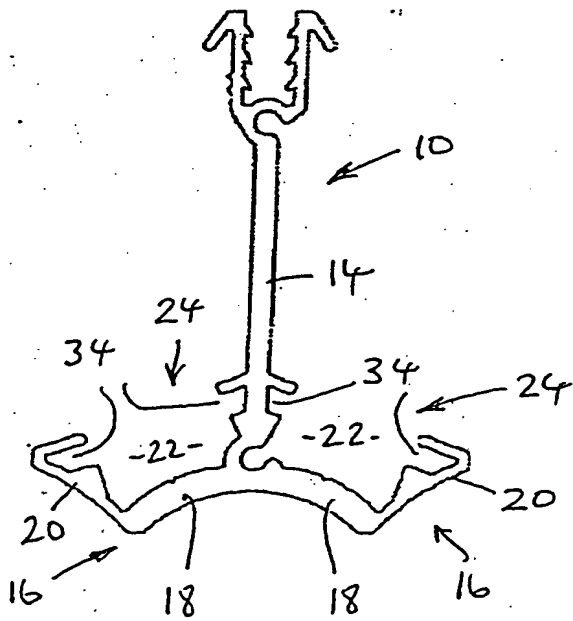


Figure 4

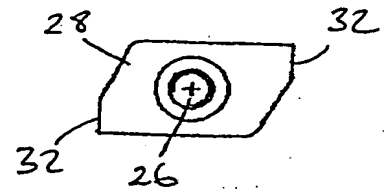


Figure 5

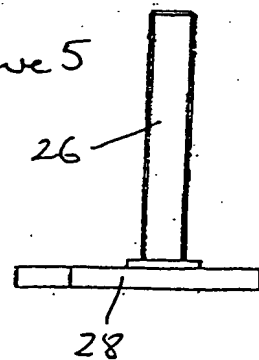




Figure 6

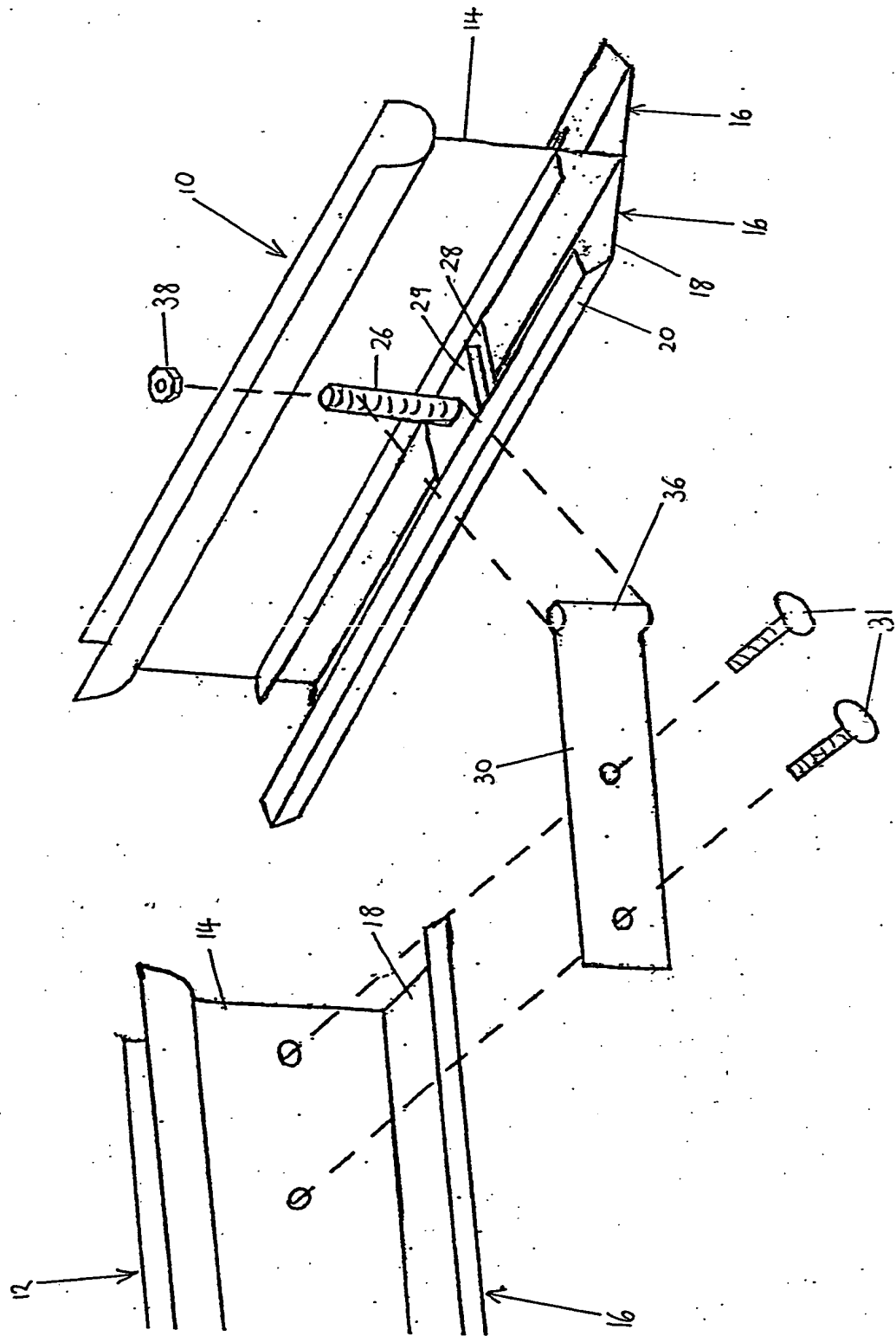




Figure 8A

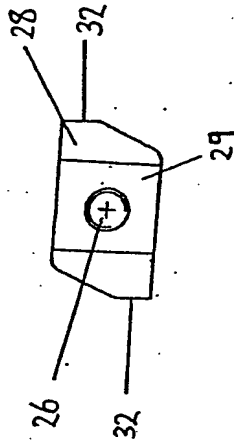


Figure 8B

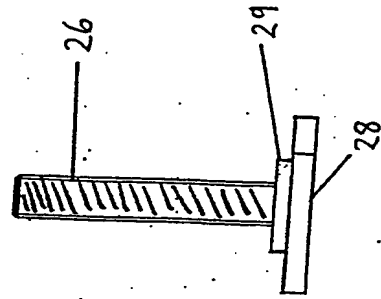


Figure 7

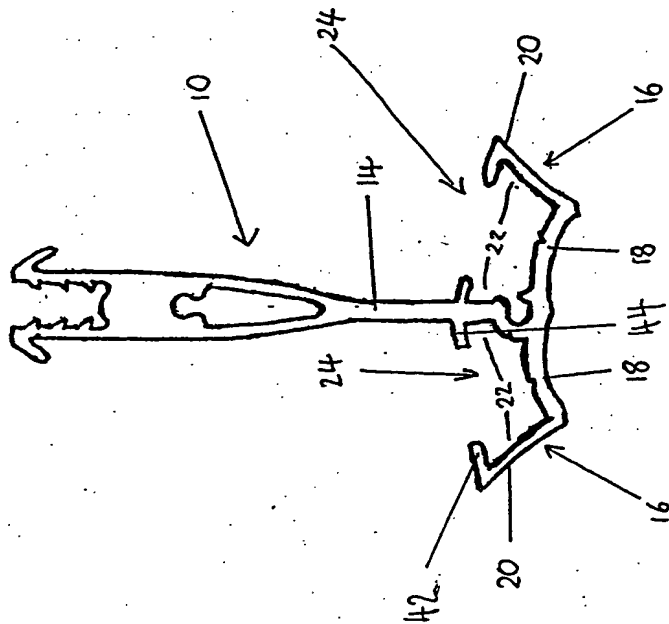




Figure 9A

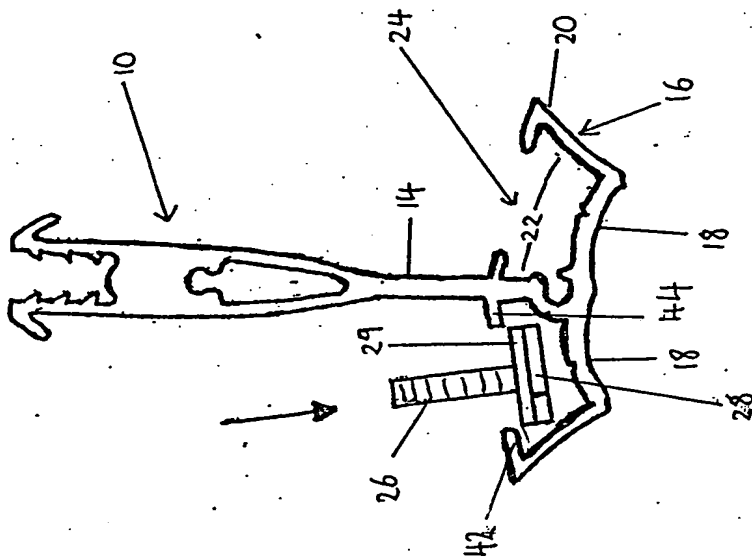


Figure 9B

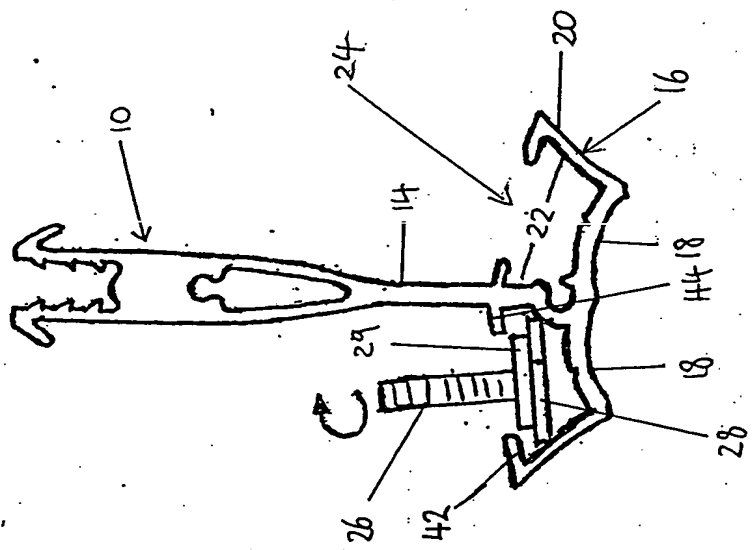


Figure 9C

